

Application No. 10/743,458  
July 13, 2007  
Reply to the Office Action dated April 11, 2007  
Page 7 of 15

**AMENDMENTS TO THE DRAWINGS:**

The attached sheet of Drawings includes new Fig. 19.

REMARKS/ARGUMENTS

Claims 1-24, 31, and 32 are pending in this application. By this Amendment, Applicant AMENDS the drawings.

The new drawing submitted on February 7, 2007 was not approved for allegedly containing new matter. Consequently, the Examiner objected to the drawings for allegedly failing to show every feature of the invention specified in the claims.

Applicant has submitted new Fig. 19 to show all of the features recited in original claims 23 and 24 and new claims 31 and 32 in schematic form only. Applicant's undersigned respectfully submits that no new matter has been entered because Fig. 19 does not show any features that were not disclosed in the original specification and claims. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the objection to the drawings.

Since the only amendment to the present application is the submission of new Fig. 19 to overcome the Examiner's objection to the drawings, Applicant respectfully requests entry of this amendment whether or not the remarks and arguments contained herein place the application in condition for allowance.

The specification was objected to for allegedly containing new matter. Applicant respectfully submits that the brief description of Fig. 19 does not add any new matter because it does not describe any features that were not disclosed in the original specification and claims. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the objection to the specification.

Claims 1, 2, 7-15, and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukai et al. (U.S. 4,693,139). Claims 1-3 and 7-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Spurny (U.S. 6,125,536). Claims 1, 2, 7-15, 21-24, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Mukai et al. Claims 1, 2, 4-20, and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishida et al. (U.S. 6,312,159) in view of Mukai et al.

Applicant respectfully traverses the rejections of claims 1-24, 31 and 32.

Claim 1 recites:

A split connecting rod comprising:  
a crank-pin hole;  
a valley provided on an inner circumferential surface of the crank-pin hole; and  
a fracture starting point groove provided at the base portion of said valley; wherein  
**upper and lower inner surfaces of the fracture starting point groove define an angle of about 10 degrees or less with respect to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the fracture starting point groove; and**  
**the valley defines an angle with respect to the predetermined fracture plane greater than the angle that the upper and lower inner surfaces form with respect to the predetermined fracture plane.**  
(emphasis added)

The Examiner alleged that Mukai et al. teaches a valley 11<sub>2</sub>, 12<sub>2</sub> and a fracture starting point groove 11<sub>1</sub>, 12<sub>1</sub> formed at a base portion of the valley. The Examiner acknowledged that Mukai et al. fails to show the upper and lower surfaces of the fracture starting point groove having an angle of about 10 degrees or less, or parallel to, the fracture plane. The Examiner further alleged:

It would have been an obvious matter of design choice to make the angle of fracture starting point groove of Mukai et al. less than 10 degrees or less from [sic] (or parallel to) the fracture plane, since such a modification would have involved a mere change in the shape of the groove. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

Applicant respectfully disagrees.

First, Mukai et al. specifically teaches that the upper and lower surfaces 11<sub>1</sub>, 12<sub>1</sub> of the fracture starting point groove form an angle  $\theta_1$  of **"45° to 50°, preferably 50°"** (see, for example, lines 44-47 in column 3 of Mukai et al.). Since Mukai et al. discloses that the angle  $\theta_1$  extends from the upper surface to the lower surface of the fracture

starting point groove, the angle from the upper/lower surface to the fracture plane is half of the angle  $\theta_1$ , i.e., **22.5° to 25°**. The Examiner has completely failed to provide any proper motivation why one of ordinary skill in the art would deviate from the express teachings of Mukai et al. that the upper and lower surfaces of the fracture starting point groove define an angle from 22.5° to 25° with respect to the fracture plane.

The Examiner is reminded that the U.S. Patent Office Board of Patent Appeals and Interferences has concluded that a rejection on the basis of design choice is clearly improper. In re Garrett, Appeal No. 580-81 (BPAI 1986) (wherein in reversing an obviousness rejection, the Board criticized that the Examiner's statement that the proposed modification would have been an obvious matter of engineering design choice with the explanation that such an assertion is a conclusion, not a reason). Further, the U.S. Court of Appeals for the Federal Circuit has concluded that a proper rejection must provide reasoning why a specific feature is a matter of design choice, and therefore obvious. In re Chu, 36 USPQ 2d 1089 (Fed. Cir. 1995). It is particularly noted that the Examiner relies on outdated case law from 1955.

Alternatively, the Examiner alleged that a "discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art."

However, the Examiner is reminded that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." In re Antonie, 195 USPQ 6 (CCPA 1977) and MPEP §2144.05(II)(B). Furthermore, Mukai et al. teaches a very narrow range of angles that the upper and lower surfaces 11<sub>1</sub>, 12<sub>1</sub> of the fracture starting point groove form with the fracture plane, and neither teaches nor suggests anything at all about modifying this range. It is noted that the Examiner's proposed modification would reduce the angle disclosed by Mukai et al. **by more than half**. Certainly, it would not have been obvious to one of ordinary skill in the art to "discover the optimum range" of

10 degrees or less, when the prior art specifically teaches an angle that is more than twice that.

Thus, Mukai et al. clearly fails to teach or suggest the features of "upper and lower inner surfaces of the fracture starting point groove define an angle of about 10 degrees or less with respect to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the fracture starting point groove" and "the valley defines an angle with respect to the predetermined fracture plane greater than the angle that the upper and lower inner surfaces define with respect to the predetermined fracture plane," as recited in Applicant's claim 1.

Second, the Examiner alleged that Spurny teaches a valley D and a fracture starting point groove 13 provided at the base portion of the valley. The Examiner acknowledged that Spurny fails to show the upper and lower surfaces of the fracture starting point groove having an angle of about 10 degrees or less, or parallel to, the fracture plane. Again, the Examiner alleged that it would have been an obvious matter of design choice, or a mere change in size, or the discovery of an optimum range to make the angle of the upper and lower surfaces of the fracture starting point groove less than 10 degrees, or parallel to, the fracture plane.

However, the fracture starting point groove of Spurny appears to form an even larger angle (e.g., 30° to 40°) with respect to the fracture plane than that disclosed by Mukai et al.

Thus, for all of the reasons discussed above with respect to Mukai et al., Spurny clearly fails to teach or suggest the features of "upper and lower inner surfaces of the fracture starting point groove define an angle of about 10 degrees or less with respect to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the fracture starting point groove" and "the valley defines an angle with respect to the predetermined fracture plane greater than the angle that the upper and lower inner surfaces define with respect to the predetermined fracture plane," as recited in Applicant's claim 1.

Third, the Examiner alleged that AAPA shows in Figs. 1A and 1B upper and

lower surfaces of the fracture starting point groove parallel to a predetermined fracture plane. The Examiner further alleged that it would have been obvious to one of ordinary skill in the art to provide the fracture starting configuration disclosed in AAPA with a valley as taught by Mukai et al. to prevent damage to the valley during the breaking and dividing of the connecting rod. Applicant respectfully disagrees.

Figs. 1A and 1B of Applicant's drawings do **NOT** show upper and lower surfaces of the fracture starting point groove being parallel to a predetermined fracture plane, as alleged by the Examiner. Fig. 1A shows a distant view of the fracture starting point groove 51 wherein the upper and lower surfaces only appear to be parallel to the fracture plane. Fig. 3 is a close up view showing the fracture starting point groove 51 shown in Fig. 1A, in which the upper and lower surfaces are clearly **NOT** parallel to the fracture plane. Furthermore, in the second full paragraph on page 1 of Applicant's specification, which addresses the fracture starting point groove 51 shown in Figs. 1A and 1B, Applicant refers to U.S. Patent No. 4,569,109 as an example of a connecting rod having a similar fracture starting point groove. As can be seen in, for example, Figs. 1, 4, and 10 of the '109 patent, the fracture starting point grooves 42, 44 and 84, 85 are clearly **NOT** parallel to the fracture plane. Accordingly, Applicant respectfully submits that the Examiner has mischaracterized the fracture starting point groove 51 shown in Fig. 1A of Applicant's drawings.

Assuming *arguendo* that it would have been obvious to combine AAPA with the valley of Mukai et al., the Examiner has failed to establish why one of ordinary skill in the art would ignore the specific teachings of Mukai et al. to provide the upper and lower surfaces of the fracture starting point groove with an angle from 22.5° to 25° with respect to the fracture plane. Since Figs. 1A to 3 of Applicant's drawings and the '109 patent fail to teach or even remotely suggest a preferred angle of the upper and lower surfaces of the fracture starting point groove with respect to the fracture plane, one of ordinary skill in the art would have been motivated to use an angle from 22.5° to 25° as taught by Mukai et al. since only Mukai et al. provides any teaching whatsoever with respect to the degree of the angle.

Thus, the combination of AAPA and Mukai et al. clearly fails to teach or suggest the features of "upper and lower inner surfaces of the fracture starting point groove define an angle of about 10 degrees or less with respect to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the fracture starting point groove" and "the valley defines an angle with respect to the predetermined fracture plane greater than the angle that the upper and lower inner surfaces define with respect to the predetermined fracture plane," as recited in Applicant's claim 1, and similarly in Applicant's claim 21.

Fourth, the Examiner alleged that Ishida et al. teaches a fracture starting point groove 21 provided at the base portion of a valley 5a, 5b, 6a, 6b. The Examiner acknowledged that Ishida et al. fails to show the upper and lower surfaces of the fracture starting point groove having an angle of about 10 degrees or less, or parallel to, the fracture plane. The Examiner alleged that it would have been obvious to one of ordinary skill in the art to provide the fracture starting configuration of Ishida et al. with a valley in view of Mukai et al. to prevent damage to the valley during the breaking and dividing of the connecting rod. Again, the Examiner alleged that it would have been an obvious matter of design choice, or a mere change in size, or the discovery of an optimum range to make the angle of fracture starting point groove less than 10 degrees, or parallel to, the fracture plane. Applicant respectfully disagrees.

Ishida et al. specifically discloses that the fracture starting point groove 21 is provided with a "**V-shaped notch cross section**" (see, for example, lines 10-12 in column 9 of Ishida et al.). Thus, the fracture starting point groove 21 of Ishida et al. is similar to the fracture starting point groove 11<sub>1</sub>, 12<sub>1</sub> disclosed by Mukai et al.

Thus, for all of the reasons discussed above with respect to Mukai et al., the combination of Ishida et al. and Mukai et al. clearly fails to teach or suggest the features of "upper and lower inner surfaces of the fracture starting point groove define an angle of about 10 degrees or less with respect to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the fracture starting point groove" and "the valley defines an angle with respect to the

predetermined fracture plane greater than the angle that the upper and lower inner surfaces define with respect to the predetermined fracture plane," as recited in Applicant's claim 1.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Mukai et al., the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Spurny, the rejection of claims 1 and 21 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Mukai et al., and the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Ishida et al. in view of Mukai et al.

In view of the foregoing remarks, Applicant respectfully submits that claims 1 and 21 are allowable. Claims 2-20, 22-24, 31, and 32 depend upon claims 1 and 21, and are therefore allowable for at least the reasons that claims 1 and 21 are allowable.

In view of the foregoing remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

To the extent necessary, Applicant petitions the Commissioner for a ONE-month extension of time, extending to August 13, 2007 (August 11, 2007 falls on a Saturday), the period for response to the Office Action dated April 11, 2007.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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